

REMARKS

Reconsideration of this application as amended is respectfully requested.

In the Office Action, claims 1-28 were pending and rejected. A portion of the specification was objected. In this response, no claim has been canceled. Claims 1, 13, 19, 25, and 27 have been amended. A portion of the specification has been amended to overcome the objection. No new matter has been added.

Claim 1 was objected. In view of the foregoing amendments, it is respectfully submitted that the objection has been overcome.

Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stracovsky et al., U.S. Patent No. 6,216,178 ("Stracovsky") in view of Saulsbury et al, U.S. Patent No. 6,128,702 ("Saulsbury"). In view of the foregoing amendments, it is respectfully submitted that claims 1-28 include limitations that are not disclosed or suggested by the cited references, individually or in combination.

Specifically, for example, independent claim 1 recites as follows:

1. A memory controller, comprising:

an array of tag address storage locations; and
a command sequencer and serializer unit coupled to the array of tag address storage locations to receive information regarding whether there is a cache hit from the array of tag address storage locations, the command sequencer and serializer unit to control a data cache located on a memory module using the received information by delivering a plurality of commands over a plurality of command and address lines, each of the commands including a plurality of segments sequentially delivered over a plurality of transfer periods of a memory access transaction and each segment being delivered within one of the transfer periods,

wherein the plurality of commands include an activate command to read data from a memory device of the memory module and a cache fetch command to fetch data from the data cache of the memory module, the activate and cache fetch commands differing in format only in the

information delivered during a last transfer period of the plurality of transfer periods, while a remainder of the segments of the activate command and the cache fetch command transferred during transfer periods other than the last transfer period remains substantially identical.

(Emphasis added)

Independent claim 1 includes limitations that each of the commands includes multiple segments, where each segment is delivered within one of the transfer periods. Some commands include an activate command to read data from a memory device of a memory module and a cache fetch command to fetch data from a data cache of the memory module. Each of the activate command and the cache fetch command includes multiple segments each being delivered over multiple transfer periods. However, only the last segment delivered over the last transfer period is different between the activate command and the cache fetch command, while the rest of the segments that are transferred over the transfer periods prior to the last transferred period are the same for both commands. It is respectfully submitted that the above limitations are absent from the cited references.

Stracovsky discloses a command sequencer to deliver segments of a universal command in different time slots. However, Stracovsky still fails to disclose an activate command to read data from the memory device and a cache fetch command to fetch data from the cache, where only the last segment transferred within the last transfer period is different while the rest of the segments are the same for both commands. The last segment 210 (refresh) of Stracovsky is not used to distinguish an activate command from a cache fetch command as described above. Rather, the segment 210 of Stracovsky is used to indicate whether certain operations should be performed or not performed (e.g., NOP operations). See, for example, Figs. 2A-2C; col. 6, line 50 to col. 7, line 11 of Stracovsky). There is no

disclosure or suggestion that the rest of the segments (e.g., segments 202-208) of the universal command in Stracovsky remain the same between an activate command and a cache fetch command. Similarly, Saulsbury fails to disclose or suggest the limitations set forth above.

In addition, there is no suggestion within the Stracovsky and Saulsbury to combine with each other. Even if they were combined, such a combination still lacks the limitations as set forth above. Therefore, it is respectfully submitted that independent claim 1 is patentable over Stracovsky in view of Saulsbury.

Similarly, independent claims 13, 19, 25, and 27 include limitations comparable to those recited in claim 1. Thus, for the reasons similar to those discussed above, independent claims 13, 19, 25, and 27 are patentable over Stracovsky in view of Saulsbury.

Given that the rest of the claims depend from one of the above independent claims, at least for the reasons as previously discussed, it is respectfully submitted that the rest of the claims are patentable over Stracovsky in view of Saulsbury. Therefore, withdrawal of the rejections is respectfully requested.

In view of the foregoing, Applicant respectfully submits that the present application is now in condition for allowance. If the Examiner believes a telephone conference would expedite or assist in the allowance of the present application, the Examiner is invited to call the undersigned attorney at (408) 720-8300.

Please charge Deposit Account No. 02-2666 for any shortage of fees in connection with this response.

Respectfully submitted,

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